Need for Speed: The Sonic Boom through time

Evoluzione del volo supersonico militare: dall'F-104 all'F-35

Generale Guido DI CRESCE

Scuola Politecnica e delle Scienze di Base – P.le Tecchio

17/05/2023

Il video è fruibile nel file "G_Di_Cresce video Diap_2"

1958 1981 2001 2016

Perché F-104?

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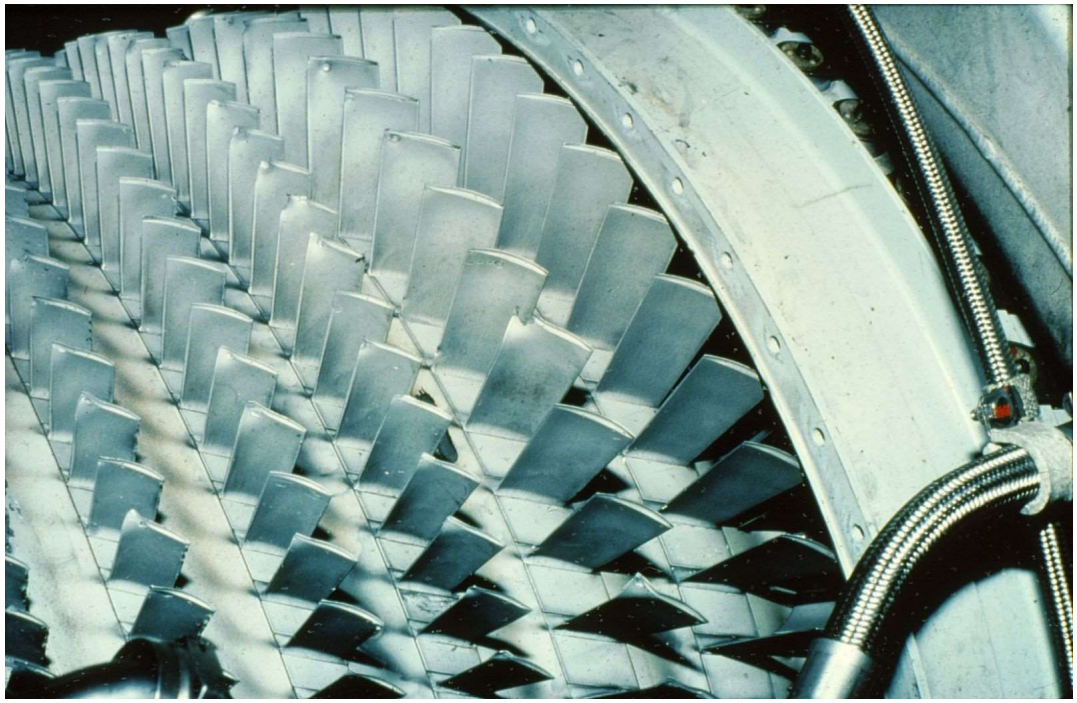
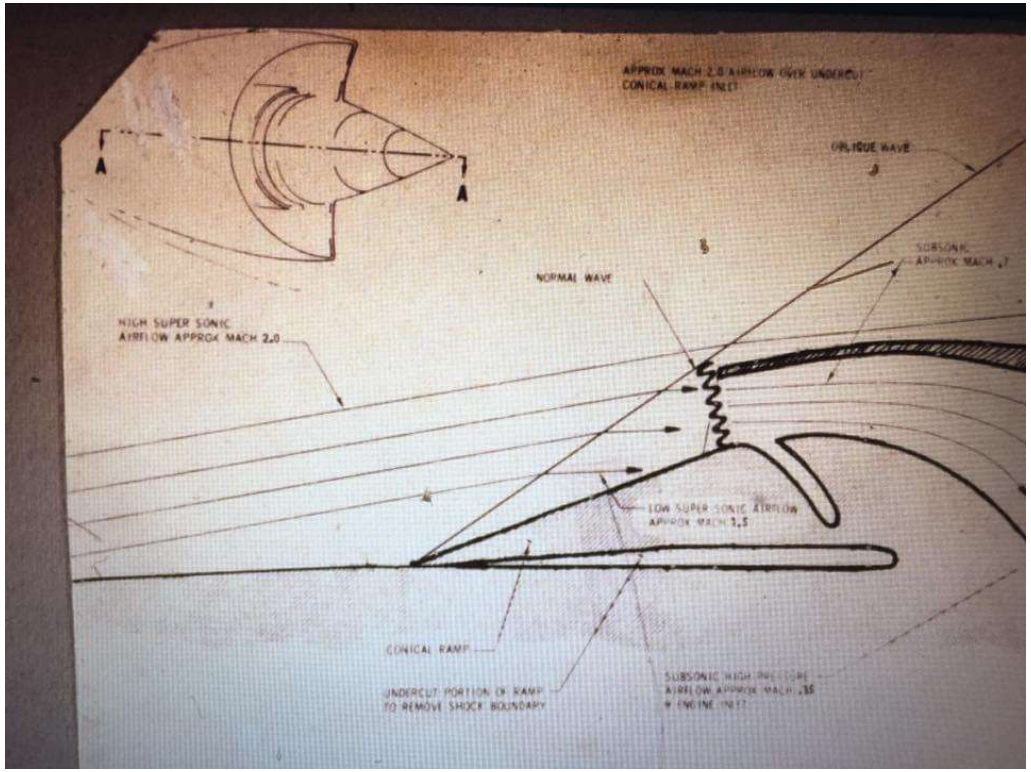
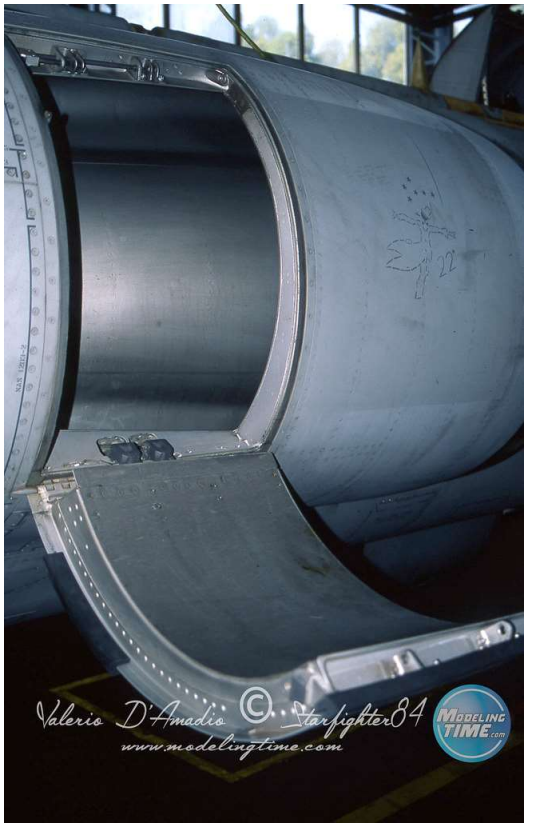
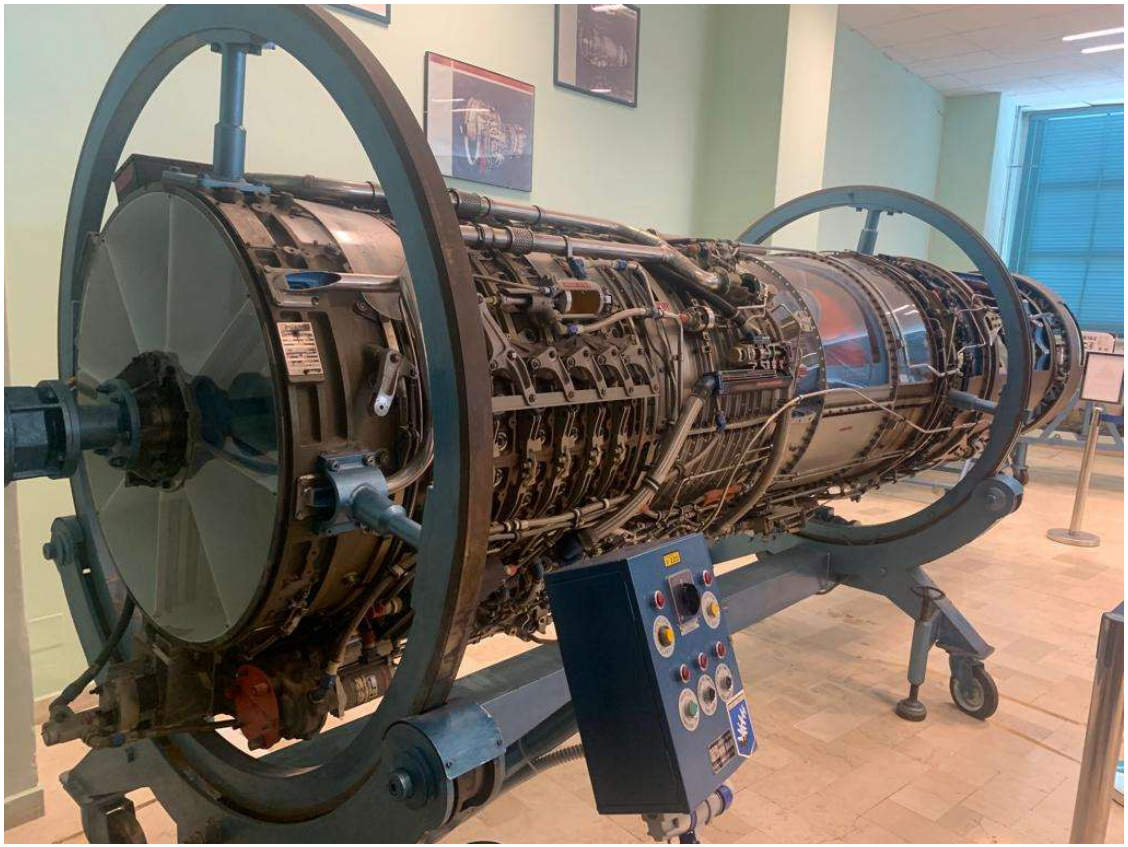


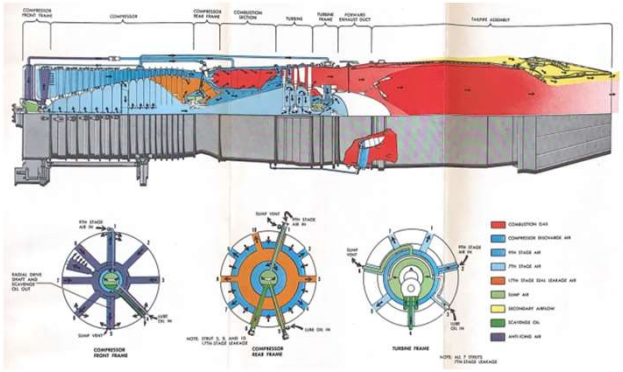
Perché F-104?

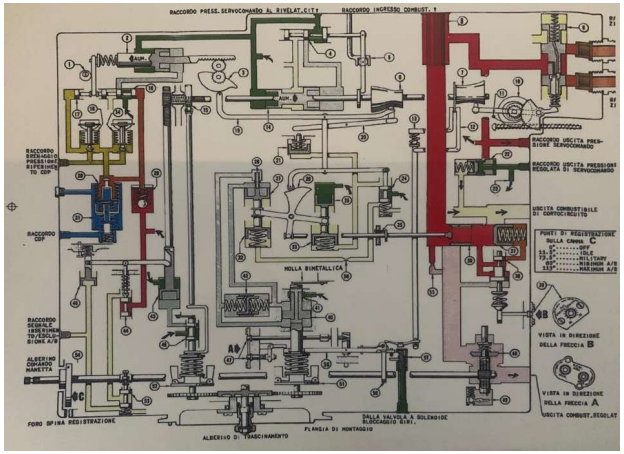

A
A
OBLIQUE WAVE
NORMAL WAVE
HIGH SUPER SONIC
AIRFLOW APPROX MACH 2.0
LOW SUPER SONIC AIRFLOW
CONICAL RAMP
UNDERCUT PORTION OF RAMP
TO REMOVE SHOCK BOUNDARY


Valerio D'Amadio © Starfighter84
www.modelingtime.com
MODELING TIME.com

Il Mitico J-79 GE 11/19

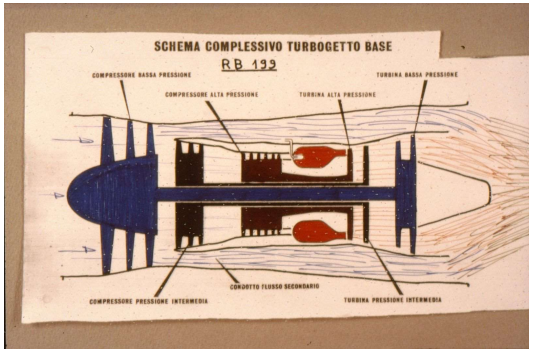


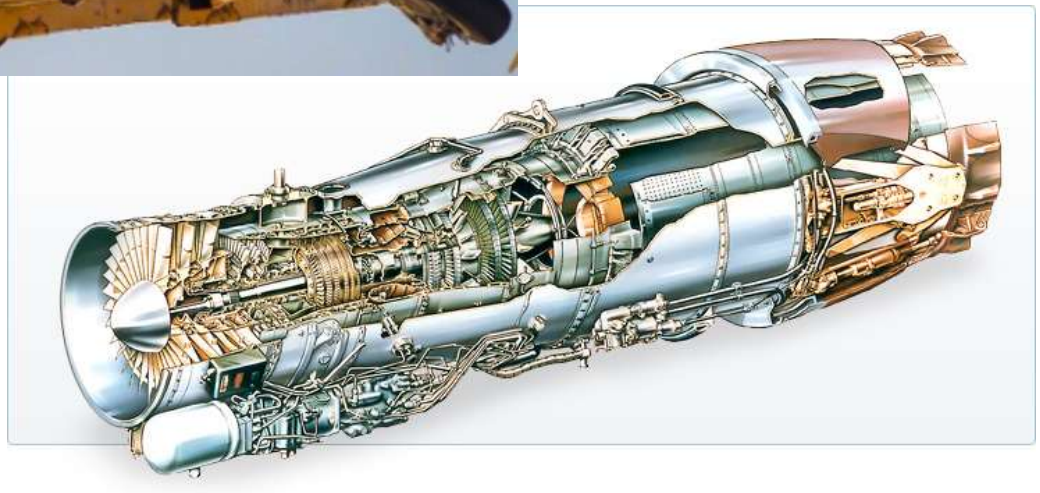




Il Panavia Tornado MRCA

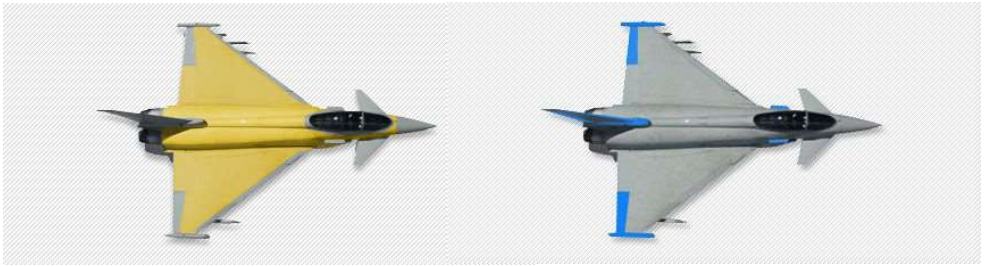
Turbo-Union RB199





Eurofighter Typhoon

Eurofighter Typhoon



compositi in fibra di carbonio

lega di alluminio-litio

BAE Systems

Airbus Defence and Space (Germany)

Alenia Aermacchi

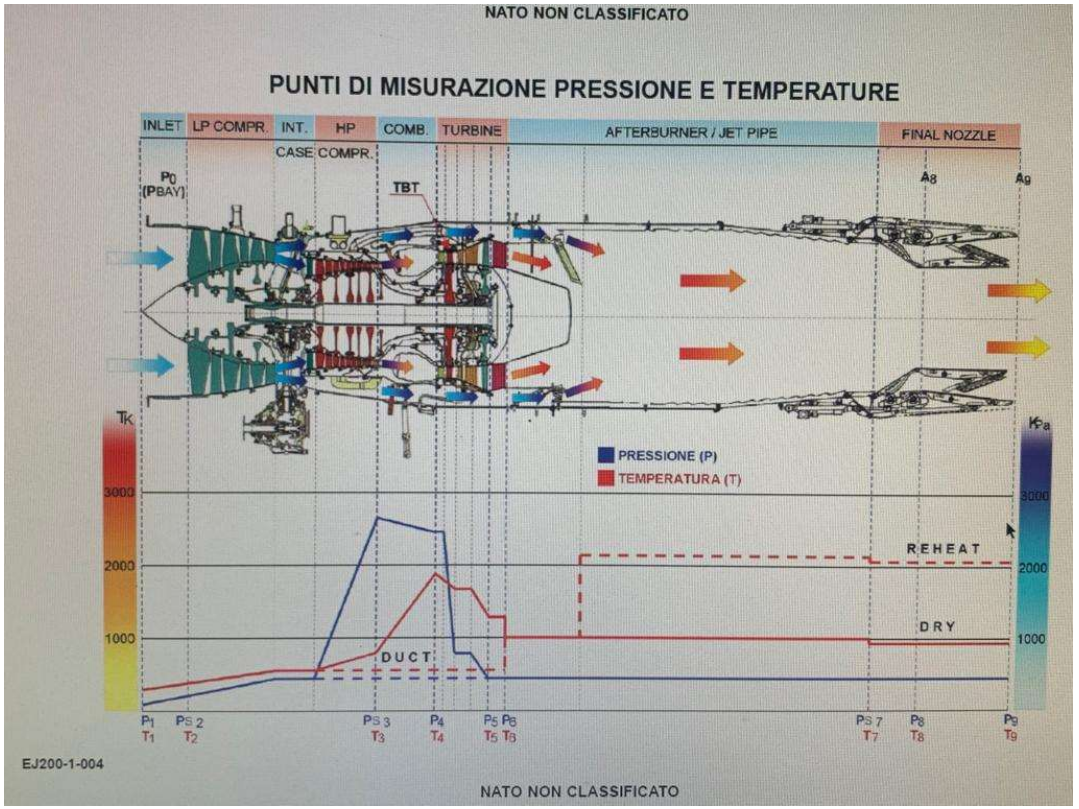
Airbus Defence and Space (Spain)

lega di titanio

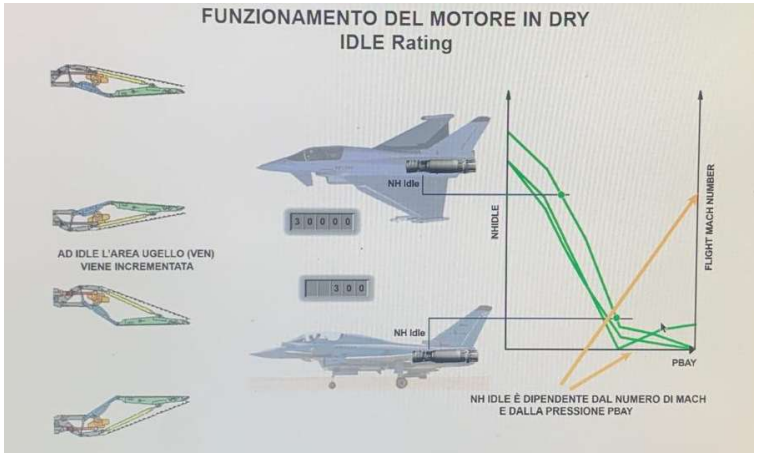
compositi in fibra di vetro

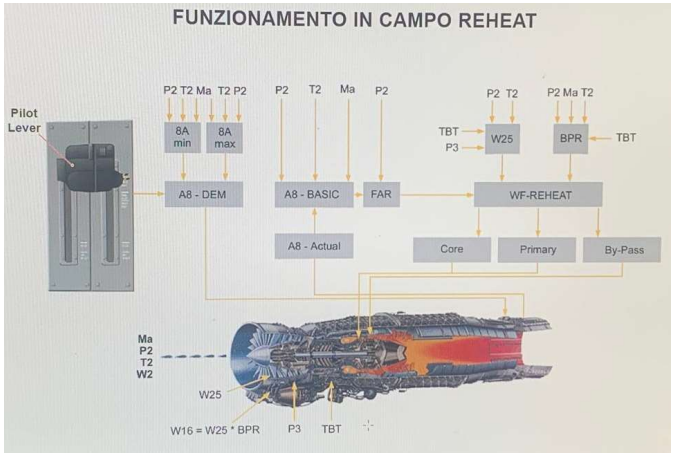
alluminio stampato

Eurojet EJ-200



Eurojet EJ-200





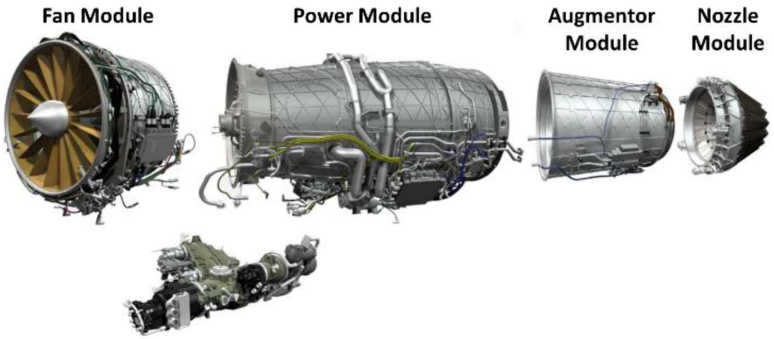
F-35

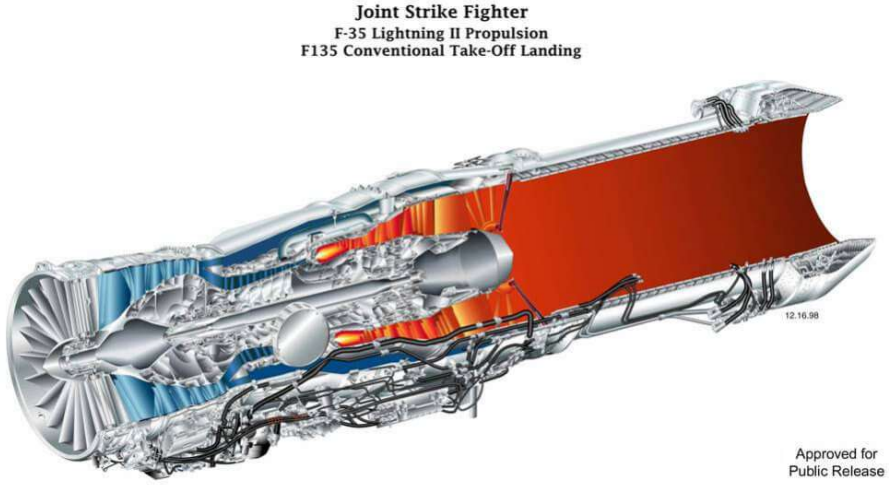
F-35

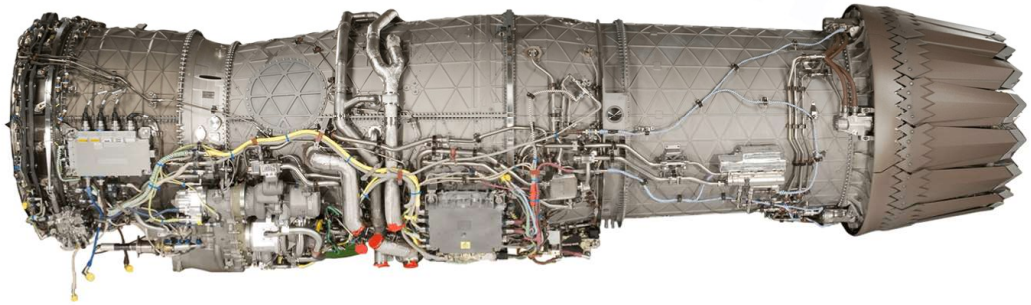
F-35


Stealth Technology
High and Fast
Air-to-Ground Only – At Night
Capability
• 1st Jets
• Supersonic
• 1st Radar
• Multirole
• LO Treatments
• Advanced Avionics
• Guided Weapons
Stealth
Fighter Performance
Integrated Sensor Fusion
Net Enabled Ops
Advanced Sustainment
• Air-to-Air
• Air-to-Surface
• ISR
• Basing Options
• Range and Persistence
• Sensor Flexibility
Parity
Parity
Parity
Slight Advantage
Unmatched
Counter Air, Strike and
ISR Mission Capability
1st Gen
2nd Gen
3rd Gen
4th Gen
5TH Gen

P&W F-135

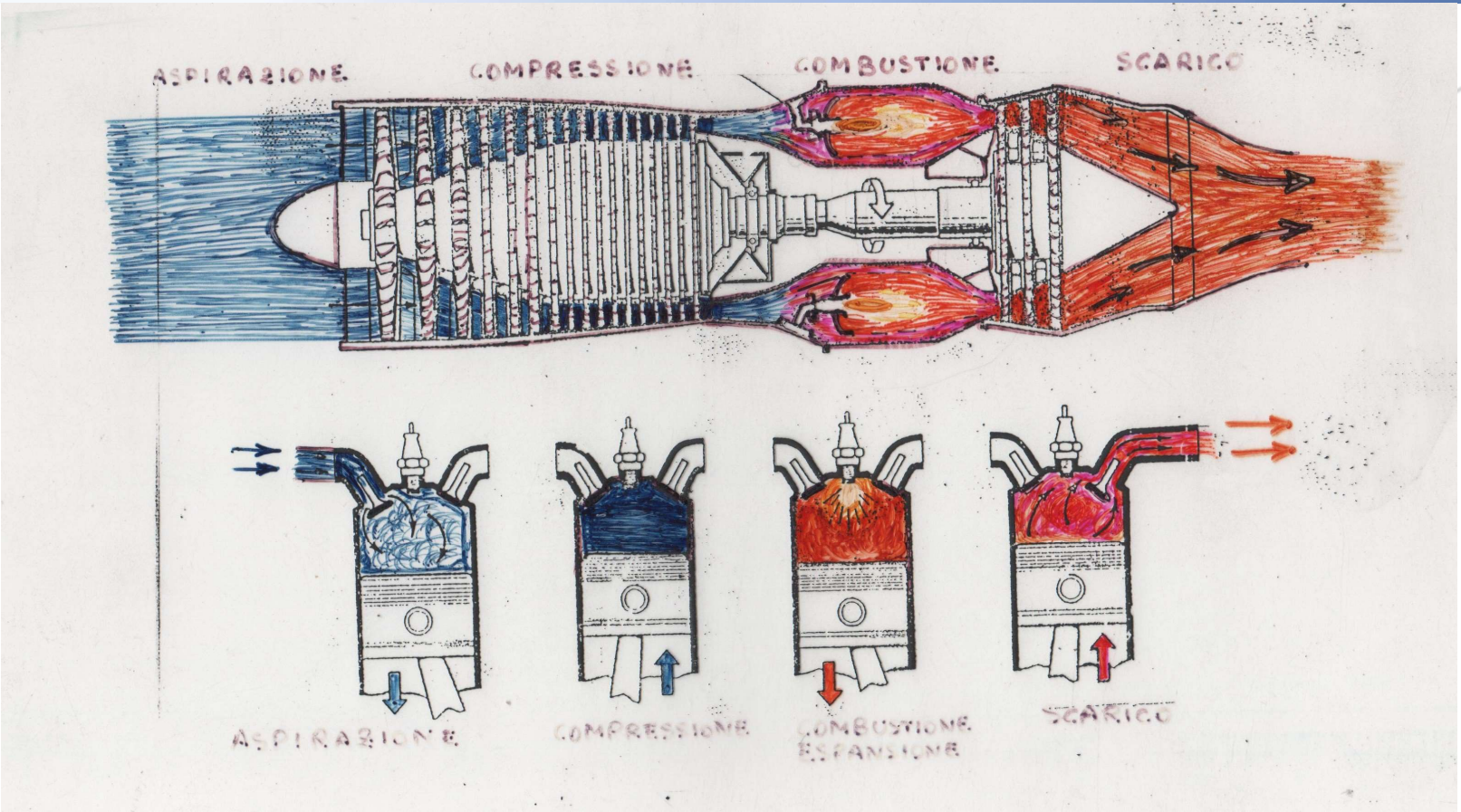

Fan Module
Power Module
Augmentor Module
Nozzle Module
Gear Box

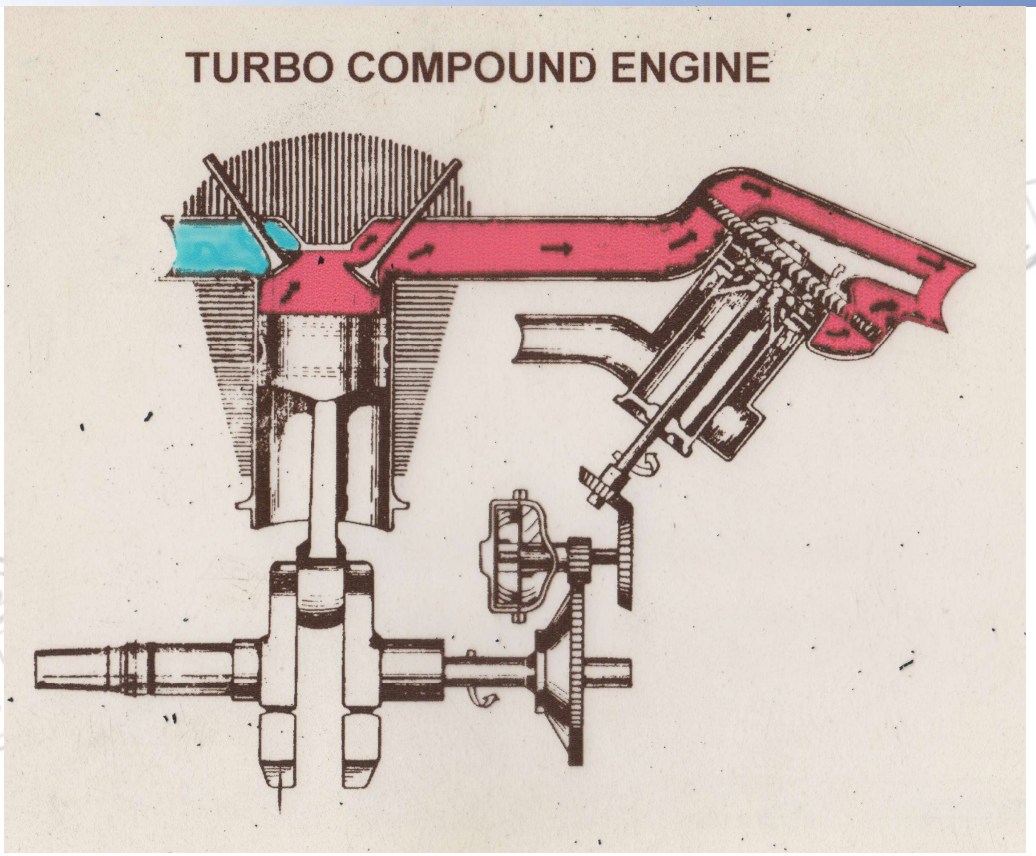

Joint Strike Fighter
F-35 Lightning II Propulsion
F135 Conventional Take-Off Landing
12.16.98
Approved for
Public Release

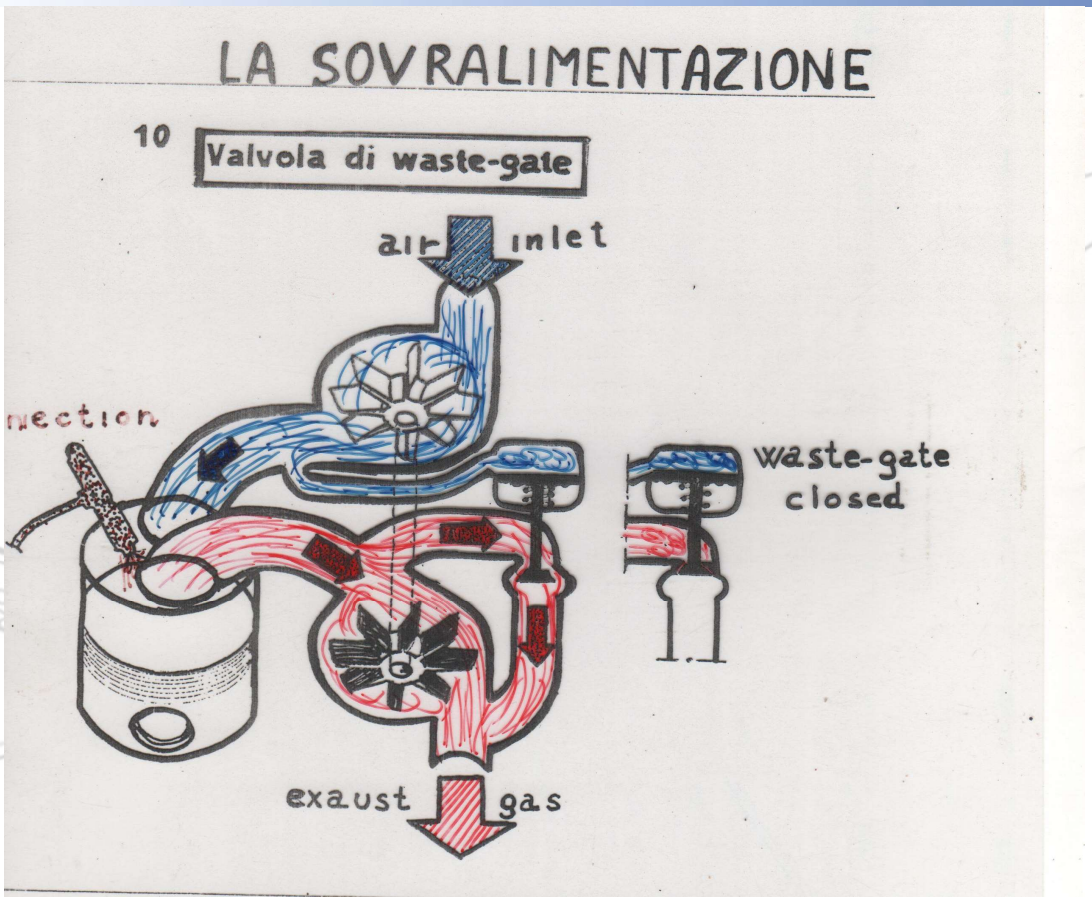


	PORTATA MASSICA (kg/s)	RAPPORTO DI COMPRESSIONE	SPINTA (kg)	RPM MAX	TIT (°C)	LUNGHEZZA (m)	PESO (kg)	CONSUMI (g/kNs)
General Electric J-79	70	12,5 : 1	8.000	7.460	930	5,3	1.740	24 (55 AB)
Turbo-Union RB199	72	23 : 1	8.000	11.000 (low) 15.000 (inter) 19.000 (high)	1.320	3,6	975	18 (59 AB)
Eurojet EJ200	74	27 : 1	9.000	?	1.480	4	990	21 (47 AB)
P&W F135	90 (?)	28 : 1	20.000	?	2.000 (?)	5,5	1.700	?

Antonio Ferri


ASPIRAZIONE
COMPRESSIONE
COMBUSTIONE
SCARICO
ASPIRAZIONE
COMPRESSIONE
COMBUSTIONE
ESPANSIONE
SCARICO


TURBO COMPOUND ENGINE


LA SOVRALIMENTAZIONE
10
Valvola di waste-gate
air inlet
nection
waste-gate
closed
exaust gas

Grazie per l’attenzione